Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (currently amended) A method of identifying biological samples comprising:

providing a microarray including a substrate having no preselected sites for association with micro-spheres coated with a composition including a population of micro-spheres dispersed in a fluid containing a gelling agent and immobilized at random positions on the substrate, at least one sub-population of said population of micro-spheres containing an optical barcode generated from at least one colorant associated with the micro-spheres and including a biological probe;

contacting said array with a biological target sample;

detecting the ~~color~~optical barcode of said sub-population of micro-spheres due to the interaction of said biological probe and said biological target sample; and

identifying said biological sample.

2. (previously presented) The method of claim 1 wherein said microarray population of micro-spheres includes a plurality of sub-populations of micro-spheres, wherein each said sub-population of micro-spheres obtains a unique optical barcode and has a unique biological probe.

3. (original) The method of claim 1 wherein said optical barcode is generated by two or more colorants.

4. (original) The method of claim 1 wherein said optical barcode is generated by a mixture of red (R), green (G), and blue (B) colorants.

5. (currently amended) The method of claim 1 wherein said at least one sub-population of micro-spheres has a luminescent property to produce a luminescent image and wherein said detecting includes:

PAGE 2/28 * RCVD AT 9/21/2004 3:28:23 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/8 * DNIS:8729306 * CSID:585 477 1148 * DURATION (mm-ss):08-10

(a) whole frame imaging capture of the luminescent image resulting from said interaction of said biological probe and said biological target sample to produce a first image;

(b) whole frame imaging capture of said microarray under bright field illumination to obtain the micro-sphere ~~color signature/barcode image~~optical barcode to produce a second image; and

(c) processing said first and second images to obtain identification of said biological target sample.

6. (original) The method of claim 5 wherein said processing uses a pattern recognition algorithm to obtain said identification.

7. (currently amended) The method of claim 1 wherein said at least one sub-population of micro-spheres has a fluorescent property and wherein said detecting includes:

(a) whole frame imaging capture of the fluorescent image resulting from said interaction of said probe and said target to produce a first image;

(b) whole frame imaging capture of said microarray under bright field illumination to obtain the micro-sphere ~~color signature/barcode image~~optical barcode to produce a second image; and

(c) processing said first and second images to obtain identification of said sample.

8. (original) The method of claim 1 wherein said substrate is characterized by an absence of specific sites capable of interacting physically or chemically with the micro-spheres.

9. (previously presented) The method of claim 1 wherein said micro-spheres bear surface active sites which contain said probe.

10. (previously presented) The method of claim 1 wherein said micro-spheres have a mean diameter between 1 and 50 microns.

PAGE 3/28 * RCVD AT 9/21/2004 3:28:23 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/8 * DNIS:8729306 * CSID:585 477 1148 * DURATION (mm-ss):08-10

11. (original) The method of claim 1 wherein said micro-spheres have a mean diameter between 3 and 30 microns.

12. (original) The method of claim 1 wherein said micro-spheres have a mean diameter between 5 and 20 microns.

13. (original) The method of claim 1 wherein said micro-spheres in the composition are immobilized on the substrate in a concentration between 100 and 1 million micro-spheres per cm^2.

14. (original) The method of claim 1 wherein said micro-spheres in the composition are immobilized on the substrate in a concentration between 1000 and 200,000 micro-spheres per cm^2.

15. (original) The method of claim 1 wherein said micro-spheres in the composition are immobilized on the substrate in a concentration between 10,000 and 100,000 micro-spheres per cm^2.

16. (original) The method of claim 1 wherein said micro-spheres comprise a synthetic or natural polymeric material.

17. (original) The method of claim 16 wherein said polymeric material is an amorphous polymer.

18. (original) The method of claim 17 wherein said amorphous polymer is polystyrene.

19. (original) The method of claim 1 wherein said micro-spheres contain a polymeric material and less than 30 weight percent of a crosslinking agent.

20. (original) The method of claim 1 wherein said micro-spheres are prepared by emulsion polymerization or limited coalescence.

PAGE 4/28 * RCVD AT 9/21/2004 3:28:23 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/8 * DNIS:8729306 * CSID:585 477 1148 * DURATION (mm-ss):08-10

21. (currently amended) A method of identifying biological samples comprising:

providing a microarray including a substrate coated with a composition including a population of micro-spheres dispersed in a fluid containing a gelling agent and immobilized at random positions on the substrate having no preselected sites for association with micro-spheres, at least one sub-population of said population of micro-spheres containing an optical ~~bar~~barcode generated from at least one colorant associated with the micro-spheres, having one of a luminescent or fluorescent property and including a biological probe sequence;

contacting~~contracting~~ said microarray~~array~~ with a biological target sample; and

detecting the ~~color bar code~~optical barcode of said sub-population of micro-spheres due to the interaction of said probe and said target by:

(a) whole frame imaging of the luminescent or fluorescent image resulting from said interaction to produce a first image;

(b) whole frame imaging capture of said microarray under bright field illumination to obtain the micro-sphere ~~color signature/barcode image~~optical barcode to produce a second image; and

(c) processing said first and second images to obtain ~~identification of said~~ identification of said biological sample.

22. (original) The method of claim 21 wherein said processing uses a pattern recognition algorithm to obtain said identification.

23. (previously presented) The method of claim 21 wherein said microarray population of micro-spheres includes a plurality of sub-populations of micro-spheres, wherein each said sub-population of micro-spheres contains a unique optical barcode and has a unique probe.

24. (original) The method of claim 21 wherein said optical barcode is generated by two or more colorants.

PAGE 5/28 * RCVD AT 9/21/2004 3:28:23 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/8 * DNIS:8729306 * CSID:585 477 1148 * DURATION (mm-ss):08-10

25. (original) The method of claim 21 wherein said optical barcode is generated by a mixture of red (R), green (G), and blue (B) colorants.

PAGE 6/28 * RCVD AT 9/21/2004 3:28:23 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/8 * DNIS:8729306 * CSID:585 477 1148 * DURATION (mm-ss):08-10